

The Human Side of Teaching

Supporting Online and Remote Students
Active and engaged Learning
Assessing the Affective Aspects of Learning
Taking Care of Ourselves
Connections: Establishing Faculty Networks
Dealing Flexibly with Uncertainty

46th Annual Conference

Improving University Teaching



Virtual Conference: July 21–23, 2021

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„Let's Talk About Science“

Workshop

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How our students define „Science“...



- ⇒ „research“: 64 entries
- ⇒ „researches“: 12 entries
- ⇒ „reasearching“:
18 entries
- ⇒ „exploring“: 10 entries
- ⇒ „exploration“: 7 entries
(in total: 111 entries)

- ⇒ „knowledge“: 51 entries
- ⇒ „findings“: 33 entries
- ⇒ „theories“: 16 entries

fig.: Word Cloud build out of **all** (n = 170) students' entries
(<https://tagcrowd.com/>; 09.12.2020); Top 50 shown of of 799 possible
words (at least 4 entries)



... in Computer Science:

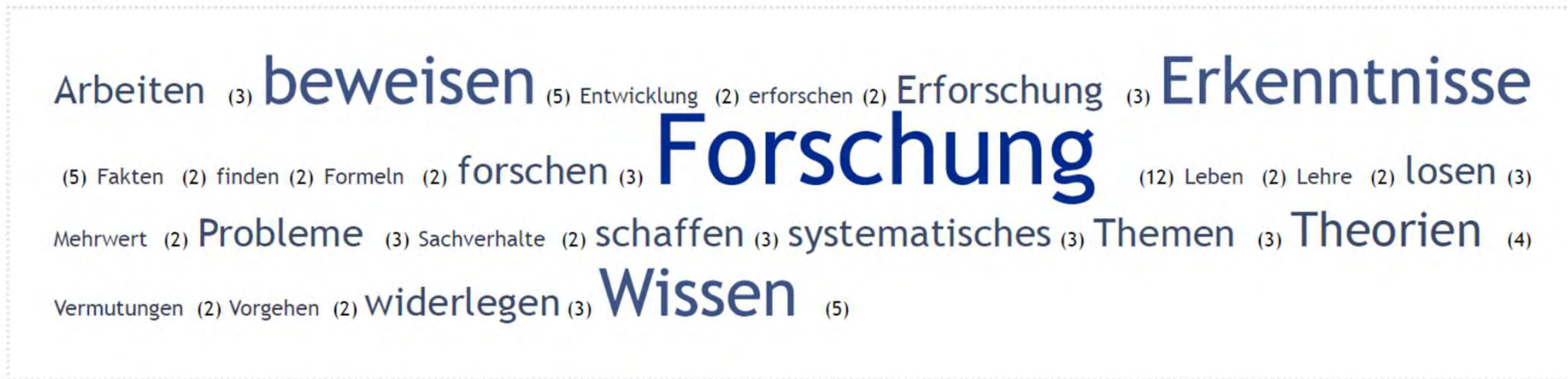


fig.: Word Cloud build out of Computer Science (n = 35) students' entries (<https://tagcrowd.com/>; 09.12.2020); Top 25 shown of of 139 possible words (at least 2 entries)

⇒ „research“: 12 entries

⇒ „researching“: 3 entries

⇒ „exploring“: 2 entries

(in total: 44 entries)

⇒ „knowledge“: 5 entries

⇒ „theories“: 4 entries

⇒ „findings“: 5 entries



And for teachers?!

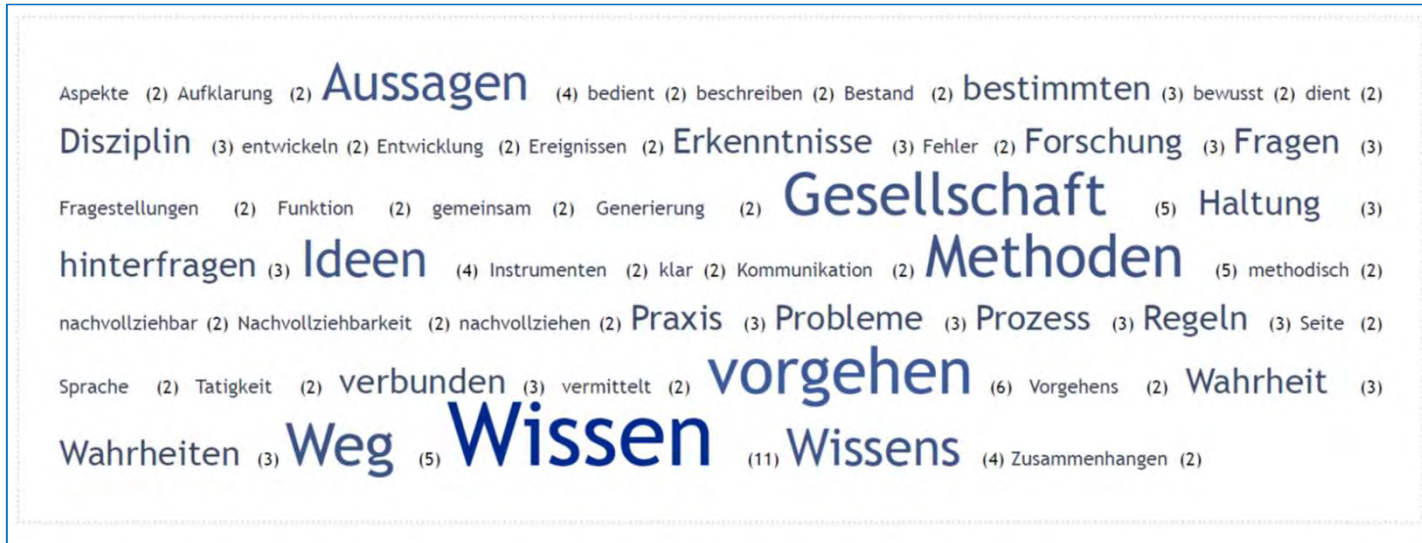


fig.: Word Cloud build out of teachers' (different disciplines; n = 10) entries (<https://tagcrowd.com/>; 09.12.2020); Top 50 shown of 442 possible words (at least 2 entries)

- ⇒ „knowledge“, „knowledges“: 15 entries
- ⇒ „society“: 5 entries
- ⇒ „methods“: 5 entries
- ⇒ „way“: 5 entries
- ⇒ „truth“, „truths“: 6 entries
- ⇒ ...



In Summary

- for students, „science“ means „research“
- for teachers, „research“ doesn't define science

- teachers define „science“ with lots of different words – there seems to be an extended range of what „science“ implies
- students use less word to define „science“ – there seems to be a very focussed understanding in what „science“ means



What does that mean for us teachers?

- What are the problems with this difference between ours (your) and our (your) students' understanding of what „science“ is?
- Which challenges do you confront?

⇒ Breakout-Session 1 (10 min): (using a padlet for your thoughts...)

Martin Hirsch + 7 + s

difference between ours and our students' understanding of what „science“ is?

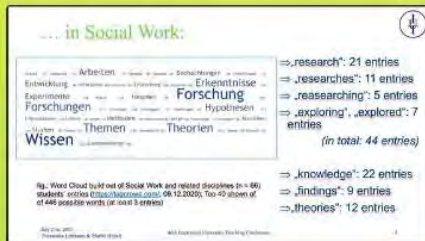
Which challenges do you confront?

is all research science?

Also, explaining that "statistically significant results" aren't everything is sometimes hard...

Scientific reality

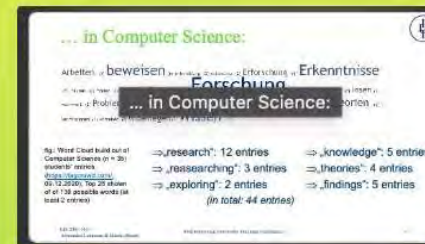
Students can be put off by the reality of an academic workload/life.



is it really science?

We have never talked to our students about their definition of science!

Misconceptions about science and what it involves arises very early in education



Students fear maths and stats

They might not have an idea that some fields are "science", too... :)

Sometimes the students lose the wonder of science in the rigidity of what we teach as they become bogged down in assessments etc



How do we (Alex and Martin) cope:

„Teaching Science“

- Alexandra: „how to work scientifically“ in Social Work
- Martin: teaching „Programming“ is more than just „hacking“



What possibilities do you have?

- How do you „teach science“?

⇒ Breakout-Session 2 (10 min): (using a padlet for your thoughts...)

Martin Hirsch + 4 • 2T.

How do you „teach science“?

- experience**
as you become more experienced your reconceptualise based on transitioning to the next level of complexity
- involves making students aware of what they don't know - helping them become aware of the limits of their knowledge**
- teach to skills, not just facts**
- first year undergraduate science**
often like a recipe book where students follow instructions - we discussed how introducing uncertainty into the research process was important - and came to the conclusion that RESEARCH was more important than KNOWLEDGE!
- I have my students define the different criteria of scientific conduct like objectivity, reliability and then we discuss what this means to them or if they have witnessed violations etc...**
- ideally: with hands-on experience (them doing research themselves)**



What remains unsolved?!

(discussion in plenum)

- not just „textbook reading“, but making it less dull
- how to make it interesting for students
- not just „textbook reproduction“, but getting new ideas, following own thoughts
- cultural representations of ‚science‘; popular representations vs. definitions of a discipline
- there aren't always answers; it's not only about „true“ or „false“, but also about discussing ideas
- ‚research‘ is extremely complex (are students skilled for that?!)
- academic writing, academic reading is also difficult and needs to be learnt
- it's also about „thinking for themselves“ linking science to real life outcomes engages students and provides an anchor for understanding



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